

## Microfluidic Cytometer for Complete Blood Count Analysis, Phase I

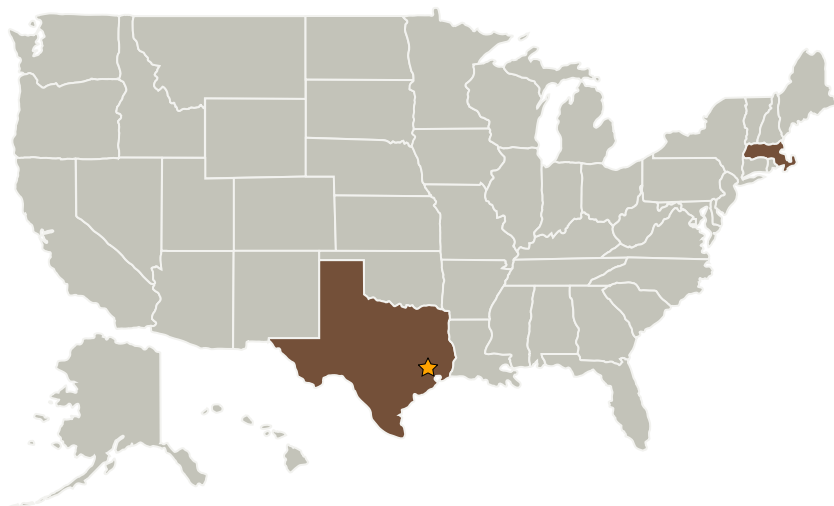
Completed Technology Project (2006 - 2006)



## Project Introduction

RMD proposes to develop a MEMS based complete blood count (CBC) instrument that can be used aboard a spacecraft. We will produce a microfluidic scale combination cell counter-flow cytometer for CBC analyses that can be communicated to ground bases by telemetry. The blood analyzer will utilize innovative optical and fluidic designs on a modular platform that enable compactness, high sensitivity and cell discrimination, combined with robust service. No operator intervention is required. Modules that require direct contact with blood will be economical and disposable. These fluidic designs will be fabricated by microstereolithography and initially tested as two separate components. A first component will constitute a hydrodynamic focusing injector and cell impedance meter. A second component will monitor forward and side scattered light from hydrodynamically focused cells using novel signal collection designs and micrometer scale, Geiger-mode avalanche photodiodes. New, custom formulated photopolymers will be evaluated for microstereolithography use and electroless deposition of metals will form the basis for fabricating microelectrodes. During Phase II, the cell impedance transducer and microoptic modules will be integrated into one credit card size package that plugs into a handheld microelectronics board containing detectors, pump, microprocessors, and an automated cell lysing stage.

## Primary U.S. Work Locations and Key Partners



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## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Center / Facility:**

Johnson Space Center (JSC)

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
Radiation Monitoring Devices, Inc.	Supporting Organization	Industry	Watertown, Massachusetts

## Primary U.S. Work Locations

Massachusetts	Texas
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## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

Carlos Torrez

## Technology Areas

**Primary:**

- TX03 Aerospace Power and Energy Storage
  - └ TX03.2 Energy Storage
    - └ TX03.2.2 Electrochemical: Fuel Cells